



Name of CTC Partner  
Federal Emergency Management Agency  
Cooperating Technical Community  
Mapping Activity Statement

**Agreement Insert Agreement # - Digital Topographic Data Development**

In accordance with the Cooperating Technical Community (CTC) Memorandum of Agreement (MOA) dated Insert Date between the Insert CTC partner Name and the Federal Emergency Management Agency (FEMA), Agreement Insert Agreement # is as follows:

- 1. Objective and Scope:** The objective of this Agreement is to develop digital topographic data for Insert Flooding Source and Study Area, including Buffer Zone (see Guidelines and Specifications for Study Contractors (FEMA 37), Appendix 4). The digital topographic data will be used for hydraulic modeling and floodplain mapping to produce Digital Flood Insurance Rate Maps (DFIRMs) for Insert Community Name(s).
- 2. Period of Performance:** This Mapping Activity will begin on Insert Start Date and end no later than Insert End Date. This Mapping Activity may be terminated at the option of FEMA or Insert CTC Partner Name in accordance with the provisions of the Insert MOA Date CTC Memorandum of Agreement.
- 3. Funding/Cost-Sharing:** This activity will be funded by Insert Name of CTC partner; FEMA funding will not be provided for this activity.
- 4. Standards:** The following standards and documents are relevant to this Mapping Activity:
  - Survey Methodology:
    - Global Positioning System (GPS) Surveys: Follow National Geodetic Survey (NGS)-58, "Guidelines for Establishing GPS-Derived Ellipsoid Heights (Standard: 2 cm and 5 cm)," November 1997.
    - Aerial Surveys: Follow EM 1000-1-1000, "Photogrammetric Mapping," March 31, 1993.
    - Conventional Surveys: Follow standard American Congress on Surveying and Mapping (ACSM) procedures.
    - Hydro Surveys: Follow EM 1110-2-1003, "Hydrographic Surveys," October 31, 1994.
  - Draft LIDAR specifications are available on FEMA's web site at [www.fema.gov/mit/tsd/MM\\_lidar.htm](http://www.fema.gov/mit/tsd/MM_lidar.htm).
  - *Guidelines and Specifications for Study Contractors* (FEMA 37). FEMA is in the process of revising Aerial Mapping and Surveying Specifications in FEMA 37, Appendix 4. The revisions will include procedures for evaluating Triangulated Irregular Network (TIN) data in accordance with the new National Standards for Spatial Data Accuracy (NSSDA) for data used in automated and semi-automated hydrologic and hydraulic modeling. Once those specifications are complete, they will apply to this Mapping Activity.
  - Digital mapping submissions will comply with the requirements of Chapter 9 and Appendix 7 of FEMA 37.

**5. Products:** Insert CTC Partner Name shall make the following products available:

- TIN data on CD-ROM.
- Hardcopy topographic maps.
- Report summarizing methodology and results.
- Completed form number 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2).
- Checkpoint analyses to assess the accuracy of TIN data including Root Mean Square Error (RMSE) calculations to support vertical accuracy.
- Identification of remote sensing data voids and methods used to supplement data voids.
- NGS data sheets for Network Control Points (NCP) used to control remote sensing and ground surveys.

**6. Schedule and Milestones:**

**Milestone 1:** Upon completion, products for the first milestone will be provided to the FEMA Project Officer. These include:

- Documentation of methodology, data analyses, date of survey/data collection, NCP, and other relevant information.
- Work plan for supplementing data voids caused by limitations of remote sensing and/or source of any supplementary data collection.

**Milestone 2 (Final Products):** Upon completion, final products for the first milestone will be provided to the FEMA Project Officer. These include:

- TIN data on CD-ROM.
- Hardcopy topographic maps.
- Report summarizing methodology and results.
- Completed form number 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2).
- Checkpoint analyses to assess the accuracy of TIN data including Root Mean Square Error (RMSE) calculations to support vertical accuracy.
- Identification of remote sensing data voids and methods used to supplement data voids.
- NGS data sheets for Network Control Points (NCP) used to control remote sensing and ground surveys.

Final products will be made available in accordance with the Period of Performance described in Section 2 of this Mapping Activity Statement.

**7. Certification:** The following certifications apply to this Mapping Activity (as appropriate):

- Registered professional engineer or licensed land surveyor, will certify topographic information, in accordance with 44 CFR 65.5(c).
- Certification by the American Society for Photogrammetry and Remote Sensing (ASPRS) is also acceptable.

- 8. Technical Assistance and Resources:** Insert CTC Partner Name may request support from FEMA's Mapping Coordination Contractor (MCC)/Technical Evaluation Contractor (TEC) in setting up control networks, assessing TIN data accuracy, and merging ground surveys with remote sensing to fill data voids. Specific technical and programmatic support provided through FEMA's MCC/TEC should be requested through the FEMA Project Officer specified in Section 12 of this Mapping Activity Statement. The MCC/TEC may be contacted at 1-877 FEMA MAP (336-2627).
- 9. Subcontractors:** Specify any contractors to be utilized by the CTC partner to complete the activity. Mark "not applicable" if none.
- 10. Quality Assurance/Quality Control (QA/QC) Procedures:** The QA/QC procedures outlined in Chapter 10 and Appendix 4 (currently being revised) of FEMA 37 should be followed during the development of topographic data for hydrologic and hydraulic modeling and floodplain mapping. The data should be independently reviewed for compliance with the standards defined in Section 4 of this Mapping Activity Statement. This independent review will be conducted by Insert Name of Entity to Perform QA/QC Review.
- 11. Reporting:** Specify reporting requirements, if any.
- 12. Points of Contact:** The FEMA Project Officer is Insert Name of FEMA PO and the CTC's Project Manager is Insert Name of CTC PM, or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representatives.

\_\_\_\_\_  
CTC Partner's authorized representative

\_\_\_\_\_  
date

\_\_\_\_\_  
FEMA authorized representative

\_\_\_\_\_  
date

\_\_\_\_\_  
State representative\*

\_\_\_\_\_  
date

\* In States where statutory and/or regulatory requirements require the State's review and/or approval of new flood hazard data, the State will be a signatory to a community's Mapping Activity Statement.